

Application No.: 09/828,225

Docket No.: 20386-00295-US

AMENDMENTS TO THE CLAIMS

1-3. (canceled)

4. (currently amended) The ~~process-chamber system~~ of claim 24, wherein the top closed barrier wall is arranged such that the solid material flows down onto the top closed barrier wall, and wherein the top closed barrier wall is inclined so as to guide the solid material flowing down onto the top closed barrier wall to the process chamber inlet of the inlet chamber.

5. (currently amended) The ~~process-chamber system~~ of claim 24, wherein the an outlet from a return duct of the external circulation of the solid material is provided at or above the inlet open top of the inlet chamber.

6. (canceled)

7. (currently amended) The ~~process-chamber system~~ of claim 24, wherein the at least one process chamber and the at least one inlet chamber are arranged next to each other.

8. (currently amended) The ~~process-chamber system~~ of claim 24, wherein each inlet chamber is arranged side by side with one process chamber adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that an inlet chamber and a process chamber are provided side-by-side so as to form the at least one set of chambers.

9. (currently amended) The ~~process-chamber system~~ of claim 24, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that a first process chamber is provided on both sides one side of an each inlet chamber and a second process chamber is provided on another side of each inlet chamber so as to form a set of chambers, said and wherein each inlet chamber being is arranged to deliver solid material to both the first and second process chambers.

10. (currently amended) The process chamber of claim 24, wherein ~~adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that a one process chamber is provided in the middle section of the set of chambers, and an~~ positioned between two inlet

Application No.: 09/828,225

Docket No.: 20386-00295-US

~~chamber is provided on both sides of the process chamber to~~ chambers so as to form a set of chambers, and wherein the two inlet chambers are arranged to deliver solid material to the one ~~said process chamber.~~

11. (currently amended) The ~~process chamber system~~ of claim 24, wherein ~~adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that~~

~~a one process chamber is provided in the middle section of the set of chambers, and~~

~~an~~ between a first inlet chamber and a second inlet chamber so as to form a set of chambers is provided on both sides of the process chamber, wherein

[[-]] the first inlet chamber is connected to the internal circulation of the solid material, and wherein

[[-]] the second inlet chamber is connected to the external circulation.

12. (currently amended) The ~~process chamber system~~ of claim 24, wherein: ~~adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that~~

~~an~~ one inlet chamber is provided in the middle section of the set of chambers,

~~a~~ between a first process chamber and a second process chamber so as to form a set of chambers; is provided on both sides of the inlet chamber,

division walls separate the first and second process chambers from the one inlet chamber, and the division walls are arranged substantially perpendicular to the at least one wall;

[[-]] inlets to the first and second process chambers are provided at the lower parts of the division walls; ~~between said two process chambers and said inlet chamber, said division walls being arranged substantially in perpendicular direction with regard to the adjacent wall of the furnace,~~

Application No.: 09/828,225

Docket No.: 20386-00295-US

[[-]] said set of chambers ~~having~~ includes a common front wall having a lower part and an upper part and arranged substantially ~~in parallel direction with regard to the adjacent~~ at least one wall; of the furnace, and

[[-]] outlets of ~~both of the~~ first and second process chambers ~~in the set of the chambers~~ are arranged in to the upper part of the front wall.

13. (currently amended) The ~~process chamber system~~ of claim 24, wherein: ~~adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that~~

~~—an~~ one inlet chamber is provided ~~in the middle section of the set of chambers,~~

~~—a~~ between a first process chamber and a second process chamber so as to form a set of chambers; is provided on both sides of the inlet chamber,

division walls separate the first and second process chambers from the one inlet chamber, and the division walls are arranged substantially perpendicular to the at least one wall;

[[-]] inlets to the first and second process chambers are provided at the lower parts of the division walls; ~~between said two process chambers and said inlet chamber, said division walls being arranged substantially in perpendicular direction with regard to the adjacent wall of the furnace,~~

[[-]] said set of chambers ~~having~~ includes a common front wall having a lower part and an upper part and arranged substantially ~~in parallel direction with regard to the adjacent~~ at least one wall; of the furnace,

[[-]] outlets of ~~both of the~~ first and second process chambers ~~in the set of the chambers~~ are arranged in to the upper part of the front wall~~[[,]]~~; and

[[-]] top closed barrier walls of ~~both of the~~ first and second process chambers are inclined in a manner such that they are slanting the top closed barrier walls slant towards the inlet open top of the inlet chamber.

Application No.: 09/828,225

Docket No.: 20386-00295-US

14. (currently amended) The process-chamber system of claim 24, wherein: ~~adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that~~

~~—an~~ one inlet chamber is provided in the middle section of the set of chambers,

~~—a~~ between a first process chamber and a second process chamber so as to form a set of chambers; is provided on both sides of the inlet chamber,

division walls separate the first and second process chambers from the one inlet chamber, and the division walls are arranged substantially perpendicular to the at least one wall;

[[-]] inlets to the first and second process chambers are provided at the lower parts of the division walls; ~~between said two process chambers and said inlet chamber, said division walls being arranged substantially in perpendicular direction with regard to the adjacent wall of the furnace;~~

[[-]] said set of chambers ~~having~~ includes a common front wall having a lower part and an upper part and arranged substantially in parallel direction ~~with regard to the adjacent at least one wall; of the furnace,~~

[[-]] outlets of ~~both of the~~ first and second process chambers ~~in the set of the chambers~~ are arranged in to the upper part of the front wall[[,]]; and

[[-]] an outlet of the external circulation of the solid material from a return duct is arranged to ~~in the adjacent at least one wall of the furnace at or above the inlet open top of the inlet chamber.~~

15-16. (canceled)

17. (currently amended) The process-chamber system of claim 24, wherein the at least one inlet chamber is provided with a grid including means for fluidizing the interior of the at least one inlet chamber by means of a fluidizing medium fed from a windbox below the grid.

18. (currently amended) The process-chamber system of claim 13, wherein the at least one inlet chamber is provided with a grid including means for fluidizing the interior of the at least one

Application No.: 09/828,225

Docket No.: 20386-00295-US

inlet chamber by means of a fluidizing medium fed from a windbox below the grid, the windbox is being divided into separate sections, each of said sections having its own means for fluidizing medium feed.

19. (currently amended) The ~~process-chamber~~ system of claim 14, wherein the at least one inlet chamber is provided with a grid including means for fluidizing the interior of the at least one inlet chamber by means of a fluidizing medium fed from a windbox below the grid, the windbox is being divided into separate sections, each of said sections having its own means for fluidizing medium feed.

20. (currently amended) The ~~process-chamber~~ system of claim 24, wherein the inlet open top of at least one or more inlet chambers among the at least one inlet chamber is provided with means for controlling the flow of the solid material into the one or more inlet chambers.

21. (currently amended) The ~~process-chamber~~ system of claim 24, wherein the inlet open top of at least one or more inlet chambers among the at least one inlet chamber is provided with means for controlling the flow of the solid material into the one or more inlet chambers in a manner such that the inlet top of the one or more inlet chambers is provided with a segmented area having its own fluidizing air supply means.

22. (currently amended) The ~~process-chamber~~ system of claim 24, wherein the inlet open top of least one or more inlet chambers among the at least one inlet chamber is provided with means for controlling the flow of the solid material into the one or more inlet chambers in a manner that the inlet top of the one or more inlet chambers is provided with a segmented area having its own fluidizing air supply means, said fluidizing air supply means having a substantially U-shaped form in a horizontal section and comprising a U-shaped tube system forming the air supply placed inside a U-shaped groove at the inlet top of the one or more inlet chambers, said tube system together with the groove reaching adjacent to both side walls and adjacent to a front wall of the one or more inlet chambers, wherein the groove opens upwards and the direction of fluidizing air is selected in a manner, that when the segmented area is fluidized, the solid material from an internal circulation IC coming down the top closed barrier wall of the at least

Application No.: 09/828,225

Docket No.: 20386-00295-US

one process chamber towards the ~~inlet top~~ of the one or more inlet chambers is forced to enter the furnace.

23. (currently amended) The ~~process-chamber system~~ of claim 8, wherein said at least one set of chambers comprises two sets of chambers are provided side by side adjacent to the rear wall of the reactor furnace, wherein ~~the~~ a particle separator system in connection with the external circulation of solid material is divided to feed the flow of solid material to ~~both~~ said two sets of chambers.

24. (new) A system including at least one process chamber in connection with a fluidized bed reactor for utilizing, for heat transfer purposes, internal circulation or external circulation of solid material, or both internal circulation and external circulation of the solid material, wherein the at least one process chamber comprises:

an interior limited by side walls having a lower part and an upper part, wherein the interior enables a flow of the solid material;

heat exchanger means provided within said interior for heat transfer from the flow of the solid material to a heat transfer medium inside the heat exchanger means;

a top closed barrier wall forming a roof of the at least one process chamber;

a process chamber inlet for carrying the solid material into the at least one process chamber, wherein the process chamber inlet is arranged in the lower part of one of the side walls; and

a process chamber outlet for carrying the solid material out of the at least one process chamber, wherein the process chamber outlet is arranged in the upper part of one of the side walls; and

wherein the fluidized bed reactor comprises:

Application No.: 09/828,225

Docket No.: 20386-00295-US

a furnace and furnace walls limiting the furnace, wherein the at least one process chamber is located inside the furnace of the fluidized bed reactor adjacent to at least one wall of the furnace walls; and

at least one inlet chamber for directing the solid material to the process chamber inlet, wherein the at least one inlet chamber is disposed prior to the process chamber in the direction of the flow of the solid material, wherein the at least one inlet chamber extends in a vertical direction and ends in an open top inside the furnace, wherein the open top is arranged to receive the flow of solid material.

25. (new) The system of claim 24, wherein the at least one process chamber and the at least one inlet chamber have a rear wall that is formed by the ~~adjacent~~ at least one wall of the furnace.

26. The system of claim 9, wherein the one inlet chamber and the ~~two~~ first and second process chambers have a rear wall that is formed by the ~~adjacent~~ at least one wall of the furnace.